

# ATOMIC ENERGY

# newsletter<sup>®</sup>

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Dear Sir:

Expansion of nuclear research facilities at Lewis Flight Laboratory, Cleveland, Ohio (operated by National Advisory Committee for Aeronautics), and intensified efforts toward nuclear powered flight by the U. S. Air Force indicate the larger magnitude of the revised U.S. aircraft nuclear propulsion program. Secretary of the Air Force D. A. Quarles has "restored a definite timetable" for completion and first flight of a nuclear propelled aircraft, Representative M.A. Price, of the Joint Congressional Committee on Atomic Energy said in Washington last fortnight. Rep. Price had previously criticized military inaction. Meanwhile the House of Representatives approved bill authorizing expenditure of \$44.7 million by NACA for research facilities, of which \$5.655 million will be for nuclear research at Lewis Laboratory.

Contract for 11,500 electrical KW nuclear power plant has been awarded Westinghouse Electric International Co., New York, by Societe Cooperative Electronucleaire, a syndicate of Belgian utilities and industrial concerns. Electronucleaire is acting as agent for Centre d'Etudes pour les Applications de l'Energie Nucleaire, a Belgian Government entity which will operate the plant. Capital costs and operating expenses will be borne by Electronucleaire. The Westinghouse unit will have a pressurized water reactor using slightly enriched uranium oxide as fuel, and will be installed near Brussels, at Mol, center for the country's nuclear research. Large part of the electrical apparatus for the plant will be produced in Belgium. Current generated by the plant, which is expected to be in operation by end of 1959, will be fed into the Belgian national grid. (Other CONTRACTS LET, BIDS ASKED, p. 3.)

Described as one of the world's largest deposits of radioactive ore is a find reported by the Indian Atomic Energy Department in North East India. Surveys are said to show that the deposit contains more than 3.3 million tons of ore containing 300,000 tons of 10% thorium; 10,000 tons of uranium of 0.3% to 0.4% concentration; and about 80 million tons of ilmenite..... New zirconium plant of Wah Chang Corp. was dedicated last week at Albany, Ore. All zirconium produced there is being shipped under USAEC instructions to various smelters, but Wah Chang said that by this July it hoped to have both reactor and commercial grades of the metal available on a direct sales basis. (Other RAW MATERIAL NEWS, p. 5).

Climax Molybdenum Co. first quarter of 1957 sales and earnings were slightly better than for the same period in 1956, annual meeting was told in New York last fortnight by Arthur H. Bunker, president. Gross sales for the three months were \$16 million, with net income \$4 million, or \$1.58 a share, he said. The company, through its control of Climax Uranium Co. and other properties and mills, is a major U.S. producer of uranium concentrates..... Additional funds are to be allocated the USAEC by Congress in bills recently introduced by the Senate and House increasing from \$10 million to \$13.3 million construction funds for the USAEC's new headquarters at Germantown, Md. (Other FINANCIAL NEWS, p. 2).

ATOMIC ENERGY FINANCIAL NEWS...

OIL FIRM WITH URANIUM INTERESTS EXPECTS RECORD REVENUES:- Kerr-McGee Oil Industries, Inc., expects record gross of about \$110.7 million for the year to end June 30, 1957, compared with \$90.440 million in fiscal 1956, according to Dean A. McGee, president. This will boost net per share to \$2.75 from last year's \$2.16. (The firm has substantial sums invested in uranium production, although most of its business is in oil and gas. At Shiprock, N.M., it has some \$2.5 million invested in a 500-ton per day uranium processing mill. A subsidiary, Kermac Nuclear Fuels Corp., 58% owned by Kerr-McGee, and separate from the Shiprock plant, will construct a processing mill with 3,300-ton per day capacity. It will sell its uranium concentrates to the USAEC under contract. Kermac Nuclear Fuels has reported uranium reserves of about 15-million tons, compared with reserves of about 8.5-million tons last year.) A capital financing program to handle its uranium and oil expansion will probably take the shape of a \$10 million common stock issue, a company official has stated. Decision on this will be made shortly, he noted.

MUTUAL FUND IN NUCLEAR FIELD PLANS STOCK DIVIDEND:- A 200% stock dividend is planned for early in August, 1957, by Atomic Development Mutual Fund, Inc., Washington, open end investment trust holding shares of companies wholly or partly in nuclear work. Net realized capital gains were 77¢ per share on Mar. 31, 1957, Newton I. Steers, Jr., president, told his shareholders in the Fund's quarterly report. Distribution of 25¢ per share will be made giving effect to the stock dividend of 200%.

DIVERSIFIED INDUSTRIAL ORGANIZATION WITH NUCLEAR ACTIVITIES SHOWS GAINS:- Increases of 93% in net sales and 103% in net earnings for first quarter of 1957, over same period of 1956, were shown by General Dynamics Corp., New York. Earnings per share for the quarter just ended were \$1.13, compared with 56¢ for first quarter of last year. (Through its General Atomic, Electric Boat, Convair, and other divisions, General Dynamics is participating in various phases of nuclear development and production, although its aircraft operations account for its dominant position as large holder of Government defense contracts. Its backlog Mar. 31, 1957 was about \$2,205 million, with aircraft orders making up greatest portion. Its Electric Boat division has expanded enormously, concentrating much activity on hulls for nuclear powered undersea craft. This May 16th, the U. S. Navy's third nuclear powered submarine, the USS Skate, will be launched at Electric Boat's Groton yards. It will be powered by reactor built by Westinghouse Electric Corp.)

ATOMIC ENERGY PATENT DIGEST... latest grants...

PATENT GRANTS TO INDIVIDUALS OR PRIVATE ORGANIZATIONS:- Radiation dosimeter using hydrogen-peroxide-colorable composition. U. S. Pat. No. 2,789,232 issued Apr. 16, 1957 to Richard J. Block. (Application date: Dec. 8, 1953.)

Radiation monitor using ionization chamber. U. S. Pat. No. 2,789,233 issued Apr. 16, 1957; assigned to Raytheon Manufacturing Co., Newton, Mass. (Application date: Apr. 30, 1953.) (Inventor: Thomas A. O. Gross.)

Geiger-Muller counter for operation at wide variations in ambient temperature. U. S. Pat. No. 2,789,242 issued Apr. 16, 1957 to Herbert Friedman, Michael McKeown. (Application date: Feb. 13, 1946.)

Device for beta-ray scanning utilizing ray source unit, ionization chamber unit, etc. U. S. Pat. No. 2,790,087 issued Apr. 23, 1957; assigned to Molins Machine Co., Ltd., London, Eng. (Application date: Sept. 7, 1954.) (Inventor: Harry Williams.)

PATENT GRANTS TO GOVERNMENT ORGANIZATIONS:- Device for investigating gases. U. S. Pat. No. 2,788,656 issued Apr. 16, 1957; assigned to United States of America (USAEC). (Application date: Nov. 17, 1954.) (Inventor: Howard H. Sander.)

Method of reducing permeability of graphite. U. S. Pat. No. 2,789,038 issued Apr. 16, 1957; assigned to United States of America (USAEC). (Application date: Dec. 3, 1953.) (Inventors: G. A. Bennett, T. H. Inatomi, J. M. Fiskin.)

Producing small grain size uranium of great dimensional and surface stability. U. S. Pat. No. 2,789,072 issued Apr. 16, 1957; assigned to United States of America (USAEC). (Application date: Dec. 22, 1952.) (Inventor: Donald W. White, Jr.)

Method and apparatus for nuclear particle acceleration. U. S. Pat. No. 2,789,221 issued Apr. 16, 1957; assigned to United States of America (USAEC). (Application date: Apr. 20, 1954.) (Inventor: Cornelius A. Tobias.)

CONTRACTS LET, BIDS ASKED...for nuclear jobs...

BIDS ASKED:- Construction job, to cost between \$6 million and \$7 million, has been opened to bids by USAEC. The work, to be a major test facility at the USAEC's national reactor testing station, Idaho Falls, is under contract AT(10-1)-878, and will be for the aircraft nuclear propulsion project there. In addition to structures and abutments, items included in the contract include sewage, contaminated waste, fuel storage systems and other related facilities.

CONTRACTS LET:- Low bid of \$7.35 million has resulted in contract award to the Italian firm of Cronzie de Nora, Milan, for electrolyzers for the Indian Government's heavy water and fertilizer project at Nangal. Unsuccessful bids were made by Canadian, Swiss, U. S., and Norwegian companies. (Total cost of the fertilizer plant has been set at \$16.8 million; for the heavy water plant firm estimate is \$4.2 million.)

Construction sub-contract for \$870,387 has been awarded Poirer & McLane Corp., New York, for excavation work at Consolidated Edison Co.'s Indian Point, N.Y., nuclear power plant. Award was made by Babcock & Wilcox Co., holding prime Con Ed contract for the job. Gas tight steel sphere 190-ft. in diameter will be anchored in the 90-ft.-deep excavation being made; sphere will house the reactor and other components of the nuclear steam generator.

George G. Sharp Co., New York, has received Maritime Administration contract to design the combination passenger-cargo vessel which will have nuclear propulsion plant. (This LETTER Apr. 16, 1957: Propulsion plant contract for first nuclear powered merchant ship awarded Babcock & Wilcox Co.) The cost-plus-fixed-fee contract awarded the Sharp organization calls for preliminary designs in three months and final plans in seven. Walter Kidde Nuclear Laboratories, Inc., New York, have been retained by Sharp for technical assistance in nuclear phases of the work.

Contract for installation of pipework at the nuclear facility at Springfields, near Preston, England, has been awarded Mitchell Engineering, Ltd., by the U.K. Atomic Energy Authority. (The Mitchell firm, in combination with AMF Atomics, Inc., New York, recently secured contract to build W. Germany's first nuclear power station: this LETTER, Apr. 16th, 1957. This was the first nuclear power contract open to international competition; the UK-US group won out over six other nuclear power concerns. Contract was awarded by Rheinisch-Westfalisches Elektrizitätswerk AG, the largest power enterprise in the Federal Republic.)

Nuclear Development Corp. of America, White Plains, N.Y., has received USAEC contract in amount of \$1,725,000 to do research, development and preliminary design work on liquid-sodium-cooled, heavy-water-moderated reactor system for Chugach Electric Association, Anchorage, Alaska. Contract award is the first phase in this project; negotiations are still underway on contract with the Chugach-NDA group for final phases.

CONTRACTS EXTENDED:- Contract held by Phillips Petroleum Co. with USAEC covering operations at the national reactor testing station, Idaho Falls, has been extended and broadened in scope. New contract will run to Feb. 28, 1961; old one would expire Aug. 31, 1958. New programs assigned the company include special power excursion reactor (SPERT) and the engineering test reactor (ERT). Phillips will continue to handle operations of the materials testing reactor (MTR), the chemical processing plant, and the central facilities services area of the testing station.

NEW BOOKS & OTHER PUBLICATIONS...on nuclear subjects...

Report of International Commission on Radiological Units & Measurement (ICRU). Recommendations of ICRU as established at meeting in Geneva, 1956; replaces earlier report issued in 1953. National Bureau of Standards Handbook 62, issued Apr. 10, 1957. 48 pages. --Supt. of Documents, Wash., D.C. (40¢)

Nuclear Reactor Physics, by Raymond L. Murray. A text, providing an introduction to analysis of reactor design. 317 pages. --Prentice-Hall, Inc., New York 11, N. Y. (\$10.)

Report on the Atom, by Gordon Dean. Second edition of this work by former USAEC Commissioner. --357 pages. --Alfred A. Knopf, New York 22. (\$5.00)

MANUFACTURERS' LITERATURE:- Uses of zirconium and hafnium in cladding, nuclear reactors and chemical equipment, are described in 12-page illustrated brochure issued by U. S. Industrial Chemicals Co. (div. of National Distillers Prods. Corp.) 99 Park Ave., New York, N.Y. Also included is data on alloy systems, mechanical and physical properties, and fabrication techniques.

NEW PRODUCTS, PROCESSES & SERVICES...for nuclear lab & plant...

PRODUCTS FROM THE MANUFACTURERS:- Small plastic valves (1/8 to 1/2 in.), for handling corrosive liquids and gases under conditions of high radiation, are now offered by this firm. For temperatures to 170-deg. F., PVC valves are recommended, while chlorinated polyether (Penton) valves are for temperatures to 250-deg. F. Materials used on other parts of the valves are Teflon, Kel-F, and 18-8 stainless steel. --Chemtrol Corp., Compton, Calif.

Standardized samples of five short-lived radioisotopes are no longer to be available from National Bureau of Standards, but will be distributed by Nuclear-Chicago Corp., Chicago 10. These are NBS standard samples 4916 (phosphorous-32); 4917 (iodine-131); 4918 (gold-198); 4923 (sodium-24); and 4933 (potassium-42). The standards the firm will issue will be derived from comparisons with NBS primary standards.

High voltage supply for nuclear instrumentation, continuously variable from 500- to 1800-volts, is said to have stability better than 0.01% per degree C. change in ambient temperature plus 0.01% for maximum change in line or load per day.

--Radiation Instrument Development Laboratory, Chicago 21, Ill.

COMMERCIAL RADIATION SERVICES OFFERED:- Van de Graaff particle accelerator, bought from High Voltage Engineering, Burlington, Mass., has been installed by Texas Nuclear Corp., Austin. The company, headed by Norman A. Bostrom, offers use of this 2-million electron-volt positive-ion accelerator as part of its physics research and consulting service.

Special laboratory is being set up by Metropolitan-Vickers Electric Co., Ltd., at the firm's Barton (England) works, where an irradiation service will be offered commercial companies. The laboratory is being equipped with a 4-million electron-volt linear accelerator (of Metrovick manufacture) which will enable firms to study the effect of irradiation on their products or investigate use of irradiation in carrying out a manufacturing process. (Metropolitan-Vickers recently supplied an accelerator of this type to the Atomic Energy Research Establishment's radiation laboratories at Wantage.)

NEW PROCESSES USING IONIZING RADIATION:- Use of irradiated coal as an additive to diesel oil to boost its BTU content is under investigation by Denver research laboratories of Denver & Rio Grande Western Railroad. Work involves adding finely ground irradiated coal (treated at Brookhaven National Laboratory) to the diesel oil, and examining its effect under operating conditions. (Normally, up to 5% low-ash coal may be used with diesel oil for higher BTU's. Irradiation of coal splits it to micron-size.)

Irradiated polyethylene instead of polystyrene is being used by Hewlett-Packard Co., Calif., for probe tips for the company's high frequency vacuum tube voltmeters. Switch was made when tests indicated that the irradiated material could stand to 250 deg. F., and still be resistant to low-temperature cracking. These were properties not obtainable with polystyrene or non-irradiated polyethylene. (Irradiation of the polyethylene was performed by Applied Radiation Corp., Walnut Creek, Calif., using ARCO's 8-million electron-volt linear accelerator.)

Inspection of fabricated nuclear reactor fuel elements by gamma radiography has been shown to be feasible in laboratory tests by Battelle Institute, Columbus, Ohio, conducted for the USAEC's Bettis Laboratory (Westinghouse Electric-operated). A line radiation source of tungsten-185 wire five mils in diameter was used in the work which was described by Meyer Pobereskin at last fortnight's Chicago Symposium on Nondestructive Tests Developed in the Field of Nuclear Energy. Paper on the subject: "A Technique for Gamma Radiographic Inspection of Parallel-Plate Fuel Assemblies", was written by Battelle technologists Calkins, Pobereskin, Price, and N. Ewbank, Jr.

A deep red tracer, octoiodofluorescein (OIF), has been found to have special affinity for brain tumors, G. T. Okita, and E. C. Tocus, Univ. of Chicago, reported before last fortnight's meeting in Chicago of the Federation of American Societies for Experimental Biology. The tagged iodine-131 in OIF permits its detection and measurement by radiation instrumentation. Using laboratory animals, the experimenters found that brain tumors concentrated the dye as much as 30 times more readily than surrounding normal brain tissue within one hour after intravenous injection. Brain tumor locators now used on human patients have a concentrating power of about four to one. OIF is also opaque to X-rays. Although not yet tried on humans, if clinical use proves successful OIF seemingly would be superior to present methods.

ATOMIC ENERGY BUSINESS NEWS...

PACKAGE POWER REACTOR IN OPERATION:- Now undergoing test operations is the 1,855 electrical kilowatt nuclear power plant built by Alco Products, Inc., Schenectady, for the Department of Defense, and installed at the Army Engineer Center, Fort Belvoir, Va. The reactor went critical April 8; current tests are preparatory to an extensive performance run to demonstrate reliability. Termed a package power plant, the unit is designed so that its components may be transported by air to remote military installations.

SITE SELECTED FOR NUCLEAR RESEARCH CENTER:- A 275-acre site in Glenwillow Village, 15-miles southeast of Cleveland, Ohio has been selected by Case Institute of Technology for its \$7 million Case Industrial Nuclear Center. Heart of the facility will be a high flux engineering test reactor with a power level of 20,000 thermal KW. Supporting facilities will be a gamma irradiation center, hot laboratories, radiochemistry laboratory, and other research units. A number of industrial firms are participating with Case in the project; one of them, the Austin Co., of Cleveland, has been given contract to design and engineer the Center.

EXPANSION PROGRAM OF NUCLEAR FACILITIES NEARS COMPLETION:- Major part of construction programs of the USAEC for expansion of its gaseous diffusion and feed materials plants, under Oak Ridge jurisdiction, has been completed. The construction program included new facilities at Oak Ridge; Paducah, Ky.; Fernald, Ohio; St. Louis, Mo.; and new plants at Portsmouth, Ohio, and Weldon Spring, Mo.

LICENSE REQUESTS MADE:- Intercontinental Chemical Corp., New York, applied for USAEC license to export 50-KW nuclear research reactor (manufactured by Atomics International div. of North American Aviation) to W. Germany..... Notice of intention to issue reactor operating license has been made by the USAEC for U. S. Naval Postgraduate School, Monterey, Calif. Reactor is being supplied by Aerojet-General Nucleonics, San Ramon, Calif. .... University of Va., Texas Agricultural & Mechanical College, and Oklahoma Agricultural & Mechanical College applied for USAEC licenses to operate research reactors..... License application to export research reactor to W. Berlin was made to the USAEC by James Loudon & Co., Inc., Los Angeles, Calif.

RAW MATERIALS...prospecting, mining, marketing...

UNITED STATES:- Payments are no longer to be made (effective May 1, 1957) by the USAEC for the vanadium content of non-carnotite ores at the Grants, N.M., Government operated uranium ore buying station. This does not affect payment schedule for carnotite-type ores. (Grants' ores have been found to contain only minor amounts of vanadium, which cannot be recovered economically. This is in contrast to ores of the carnotite-roscoelite type found in other areas which usually contain over five parts vanadium oxide for each part of contained uranium oxide.)

CANADA:- Some 35,633 tons of uranium ore grading 4.45-lbs. of uranium oxide per ton were shipped by Rix-Athabasca Uranium Mines to Eldorado Mining & Refining's mill in 1956, company's annual report shows. Gross of \$948,958 was realized on the shipments, or per ton income of \$26.63..... Three Saskatchewan companies, Loranda Uranium Mines, Forbes Lake Mining Corp., and Winston Mining Corp., have merged into Westore Mines, Ltd., Toronto, on basis of one share of Westore for each three shares in any of the three companies. Westore holds 18 claims in the Beaverlodge area of Saskatchewan, as well as 1,280 acres of leases in Wyoming. As result of the merger, Westore acquired seven groups totalling 170-claims in northeastern Saskatchewan.

ITALY:- Following encouraging preliminary investigations, the Fiat Company has applied to Italian Ministry of Industry and Trade for permit to prospect for radioactive minerals in the district of Cavour, near Cuneo, Northern Italy. Initial prospecting had been done there for Fiat by staff of the Polytechnical Institute, Turin. (Societa' Ricerche Impianti Nucleari (SORIN), floated jointly by Fiat and Societa' Montecatini for purpose of prospecting for uranium and exploiting it commercially, is increasing its original capital of 100 million lire to 2 billion lire, preliminary to intensification of prospecting in promising districts of Italy.)

Sincerely,

The Staff,  
ATOMIC ENERGY NEWSLETTER

